

US006494158B1

## (12) United States Patent Ruffa

(10) Patent No.:

US 6,494,158 B1

(45) Date of Patent:

Dec. 17, 2002

(54)	METHOD	<b>FOR</b>	REDUCING	<b>STRUM</b>	IN TOW
	CARLES				

(75) Inventor: Anthony A. Ruffa, Hope Valley, RI

(US)

(73) Assignce: The United States of America as

represented by the Secretary of the Navy, Washington, DC (US)

(\*) Notice:

Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/718,759

(22) Filed: Nov. 24, 2000

(51) Int. Cl.<sup>7</sup> ...... B63B 21/56; G01V 1/38

(52) U.S. Cl. ...... 114/253; 367/16

(56) References Cited

## U.S. PATENT DOCUMENTS

3,596,070 A	٠	7/1971	McCool et al	114/245
3,801,071 A	٠	4/1974	Barron	114/254
3,860,899 A	٠	1/1975	Watlington	367/131

3,884,173 A	٠	5/1975	Fabula	114/243
4,210,897 A	٠	7/1980	Hutchins	114/244
4,281,402 A	٠	7/1981	Kruka et al	367/15
4,314,363 A	•	2/1982	Thigpen et al	114/244
4,570,245 A	٠		Thigpen	
4,581,723 A	٠		Savit	
4,910,715 A	٠		Savit	
5,275,120 A	٠		Ruffa et al	
5,381,909 A	٠		Warnan	
5,790,472 A	٠		Workman et al	
6,244,204 B1	٠		Weyman	

<sup>\*</sup> cited by examiner

Primary Examiner—S. Joseph Morano
Assistant Examiner—Andrew Wright
(74) Attorney, Agent, or Firm—Michael J. McGowan;
Michael F. Oglo; James M. Kasischke

## (57) ABSTRACT

A method for reducing strum in tow cables. Such tow cables typically extend from a marine vessel and have their lengths controlled by a winch on the deck of the ship and have a tow component at their distal end. The length of the cable is adjusted so that the number of longitudinal waves is an integral number of the number of transverse waves is an odd integral number.

## 16 Claims, 2 Drawing Sheets

